UNITED STATES MARINE CORPS
Logistics Operation School
Marine Corps Combat Service Support Schools
PSC Box 20041
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LOC 1609

MOTOR VEHICLE ACCIDENT PREVENTION

LEARNING OBJECTIVES:

1. Terminal Learning Objective: Given the requirement to maintain a unit ground safety program and the references, maintain ground safety program, to insure procedures are implemented to minimize mishaps. (0402.01.05)

2. Enabling Learning Objectives: Given the references and a requirement to maintain a ground safety program, identify techniques employed to prevent mishap, per the references. (0402.01.05d)

(1) Given the references and a requirement to maintain a ground safety program, identify the elements that are responsible for causing an accident/mishap, per the references. (0402.01.051)

(2) Given the references and a requirement to maintain a ground safety program, identify the safety regulations that must be enforced in a motor transport operations section, per the references. (0402.01.05m)

1. IDENTIFICATION OF THE PROCEDURES FOR THE PREVENTION OF ACCIDENTS/MISHAPS

a. A mishap is an interruption in an intended course of action resulting in injury or death to a person or damage to equipment or property incident to a Marine Corps operation or activity that is not the result of combat operations or direct action by a hostile or belligerent force.

b. The Cause of Accidents/Mishaps. There are three basic elements, or a combination of the three, that may cause a mishap: the individual, the agent immediately causing the injury or property damage, and the environment.

(1) The individual injured almost always is partially to blame when a mishap occurs. Safety experts estimate that unsafe behavior accounts for approximately eighty-five percent of all accidents. Even in the remaining percentage, human error may be involved. In addition to being the primary cause of mishaps, human behavior is also the most difficult to analyze and to change.

(2) The agent is the object, substance, or person immediately causing the injury.

(3) The environment refers to the physical surroundings in which the mishap occurred and the condition of those surroundings. Hazards or unsafe conditions in the environment are the easiest to detect and correct, but it is important to note that human behavior is often responsible for the existence of unsafe conditions.

2. <u>TECHNIQUES EMPLOYED TO PREVENT ACCIDENTS/MISHAPS</u>.

a. There are three techniques, which are effective in reducing mishaps and keeping them to a minimum. These methods are engineering, education, and enforcement.

(1) Engineering involves the use of qualified personnel who are familiar enough with a given job, a piece of equipment, or activity to be able to make a valid assessment of the safety factors involved. The five basic factors of safety engineering are: knowing the hazards, finding the hazards, eliminating those hazards which can be eliminated, guarding against those hazards which cannot be eliminated, and avoiding the creation of new hazards.

(a) Knowing the hazard requires the skill and experience of someone who has worked with the particular job, piece of equipment, or activity. The individual to determine specific safety requirements must perform a task analysis.

(b) Finding the hazards in a given job, operation, or activity involves the use of supervisory personnel who have the skills and ability to detect those hazards.

(c) Elimination of unnecessary hazards does not imply that a particular job, operation, or activity must be avoided. In the Marine Corps there are hazardous duties that must be performed. The objective is to reduce or remove hazards that are unnecessary. This can be done by:

1. Correcting, changing, or modifying a mechanical feature of the job, operation, or activity, such as making sure mechanics use some type of respirator and protective clothing when working on components of the vehicle's brake system that contain asbestos or when using Chemical Agent Resisting Coating (CARC) paint to paint equipment.

2. Emphasizing the human aspect by drawing attention and adjusting to the hazards, such as making sure that tasks that require endurance and strength are assigned to those who can accomplish the task.

(d) Compensating for hazards which cannot be removed requires the teaching of correct procedures involved in doing the job, operating the equipment, or engaging in the activity. It also involves making the individual aware of the hazards and making sure that the individual has the necessary skills to compensate for them. An adequate number of supervisory personnel are extremely important in this regard.

(e) Avoiding the creation of unnecessary hazards necessitates continuous supervision by competent personnel to make sure that the jobs, operations, or activities are being conducted in the most efficient manner. Periodic evaluations of jobs, operations, and activities are also essential to make sure that new hazards "do not creep in."

(2) Education and training are the means for developing safe behavior in people. Education, compared to engineering and enforcement, is a long slow procedure that the results of are hard to see; however, it gives the most durable and long lasting results.

(3) Enforcement is primarily a matter of adequate and competent supervision. Continuous supervision is necessary to train an individual to perform safely.

3. IDENTIFICATION OF THE UNIT'S RESPONSIBILITIES FOR THE PREVENTION OF MISHAPS/ACCIDENTS

a. Responsibilities of the Commanding Officer for the prevention of Mishaps/Accidents.

(1) Safety is the responsibility of the command, and commanding officers at every echelon are responsible for

conducting a continuous, vigorous effort toward the prevention of mishaps in all operations and activities.

(2) Command action is just as essential to success in preventing mishaps as it is to any other military mission. At every level of command, the mishap prevention effort requires command attention to plan for safety, to establish, apply, and promote codes and standards, and report mishap situations and losses. To accomplish this, the commanding officer should take the following actions:

(a) Publish the command policy for safety.

(b) Plan and organize the unit safety program.

(c) Designate the unit safety manager by name and make sure that each task is understood, supervised and accomplished.

(d) Make sure that adequate provisions for safe practices are incorporated into all directives, training doctrine, and standing operating procedures.

(e) Fill out an operational risk management card on all training evolutions.

b. Responsibilities of the Unit Safety Manager for the Prevention of Mishaps/Accidents.

(1) The success or failure of the unit safety program is directly related to the efforts of the safety manager. The manager must develop and implement an imaginative and comprehensive mishap prevention program within the scope of the unit's combat mission and within the limits of reality in terms of the time and resources available.

(2) The unit safety manager will make recommendations to the commanding officer for the establishment and maintenance of a continuous safety education and mishap prevention effort which will provide a safe environment and result in safe performance consistent with the unit's mission. To accomplish this, the safety manager must create interest in safety among all personnel in the command, from the commanding officer to the newest recruit.

(3) In order to employ the aforementioned techniques, the safety manager must understand the psychological and

physical factors, which motivate safe performance, and those, which lead to unsafe behavior. To maintain interest in safety once it has been established, the unit safety manager should:

(a) Supply the commanding officer, staff and subordinate unit heads with brief periodic safety progress reports and information concerning mishaps.

(b) Provide periodic briefings to supervisors, platoon leaders, and noncommissioned officers regarding safety program objectives, how these objectives can be attained, and the degree of success in achieving them.

(c) Promote safety campaigns to keep the individual Marine constantly aware of their responsibility for mishap prevention and the need for continuing safety awareness in the performance of duty.

(d) Become familiar with the principles of mishap prevention.

(e) Become familiar with Marine Corps orders concerning safety (5100 series) and safety standards.

(f) Analyze the unit's mishap experience.

(g) Evaluate the adequacy of the safety program in the light of unit mishap experience.

(h) Make recommendations for revisions in the safety program on the basis of evaluation.

(i) Select top-quality NCOs to assist in operating the unit safety program.

(j) Make sure that all supervisory personnel, in addition to NCOs designated to assist the safety manager, understand and apply appropriate safety rules in all tasks and activities under their control.

(k) Make sure each mishap is investigated and reported on promptly.

(l) Review mishap investigations/reports as part of the mishap analysis effort.

(m) Maintain appropriate mishap records.

(n) Make periodic safety inspections to identify unsafe practices and conditions.

(o) Recommend appropriate action to remove or control hazards.

(p) Procure materials for safety training, based on need.

(q) Recommend job reassignments or additional training for violators of safety rules, before mishaps occur.

4. ENFORCEMENT OF SAFETY REGULATIONS WITHIN A MOTOR TRANSPORT OPERATIONS SECTION

a. Safety Requirements for Changing Tires

(1) Supervisors should make sure that their Marines know not to work under any vehicle that is only supported by a jack, as in the case of changing tires. If the tire is to be removed from a vehicle that is parked on unstable ground, a block of wood or some other flat solid object should be placed under the jack to prevent it from sinking into the ground, prior to raising the vehicle.

(2) You should also make sure that your Marines apply the vehicle's parking brake and place wheel chocks by the wheels on both sides of the vehicle to prevent vehicle movement. Encourage the use of jack stands when possible.

(3) Caution should be observed when replacing the wheel stud nuts because wheel stud nuts on the left side have left hand threads and those on the right have right hand threads.

(a) Removing the wheel assembly.

1. Make sure that the jack is placed as close as possible to the wheel being removed; for example, under the lower control arm or under the axle. Bring the jack in contact with the vehicle, but do not raise the wheel off the ground.

2. All wheel stud nuts should be loosened but not removed at this time.

3. Next, the vehicle should be raised with the jack until the tire is off the ground.

4. Now, the wheel stud nuts can be removed from their studs, and the wheel removed from the vehicle.

(b) Installation of the wheel assembly.

1. The wheel should be placed on the axle hub over the wheel studs, using care not to slide the wheel across the stud threads. The stud nuts should be installed and tightened until seated.

2. The vehicle can now be lowered and the jack removed.

3. At this time, the wheel stud nuts should be tightened securely in the sequence outlined in the technical manual for the vehicle being repaired.

4. Organizational maintenance personnel should, as soon as possible, check the lug nuts and tighten them to proper torque specifications.

b. Safety Requirements for Replacing Tires on Rims.

(1) One of the greatest potentials for serious injury and even death is in mounting and demounting tires. It is essential that your personnel fully realize the potential dangers of compressed air when working with tires. Make sure that your Marines follow the manufacturer's procedures and cautions for the type of tire changer being used.

(2) Make sure all tools that are being used by your Marines are in good condition; not damaged, dented, or deformed.

(3) Make sure that they do not loosen flange ring lock nuts until all air is exhausted from the tire. A broken or cracked rim parts under pressure could blow apart and seriously injure or kill if the lugs are removed before the air is completely exhausted.

(4) Make sure that they remove the valve core to exhaust all air from the tire before demounting. Probe the valve stem with a wire as a final check to make sure the valve is not plugged.

(5) Your Marines should clean and inspect used rim parts and not attempt to rework, weld, heat, or braze damaged rim parts. They should inspect the inside of the tire for loose cords, cuts, penetrating objects, or carcass damage.

(6) All dirt, debris, and liquids should be removed from inside the tire before mounting the tire on the rim.

(7) Your Marines should never inflate a tire with a lock ring when the lock ring is unseated. They should securely lock the wheel down or place the wheel assembly in a safety cage or portable safety device before attempting to inflate the tire to seat the beads.

(8) They should not inflate the tire beyond recommended bead seating pressure, or stand over the tire while it is being inflated.

(9) The air pressure should be adjusted to manufacturer's recommended cold operating pressure after the beads have been seated.

(10) The valve cores should be inspected for proper air retention, and damaged or leaky valve cores should be replaced.

(11) After tire inflation, the tire, rim, and lock ring, if applicable, should be inspected while still within the restraining device to make sure they are properly seated and locked.

(12) If further adjustment to the tire, rim, or lock ring is necessary, the tire should be deflated by removal of the valve core before the adjustment is made.

c. Safety Requirements for Refueling Vehicles

(1) Because of the fire hazard, make sure that your Marines obey the safety regulations for the dispensing of fuel. Make sure that they know not to pump fuels with the engine running on the vehicle being fueled, and make sure that the equipment is bonded and grounded. They also should not smoke or allow smoking anywhere near the refueling operation.

(2) Make sure that your Marines do not block the fuel nozzle open with a fuel cap or any other device. This is asking for an overflow; the automatic shut-off has a purpose.

(3) Make sure that they keep their body and face away from the filler neck to prevent getting doused by an overflow.

(4) Overflows can be avoided by dispensing fuels slowly to allow air pressure to escape, and to prevent foaming from occurring.

(5) Make sure that they drain all fuels from the nozzle before returning the nozzle to its proper place.

(6) All hoses should be placed back on the vehicle or rack carefully to avoid loops or twists that could catch on the vehicle as it pulls away.

(7) Make sure that your Marines always follow the refueling instructions for a particular piece of equipment in accordance with the technical manuals.

(8) Also make sure that they are aware that Marine Corps and civilian regulations prohibit the dispensing of fuels into any container except a properly labeled fuel container.

d. Safety Requirements for Painting Vehicles.

(1) The painting of equipment should always take place outdoors. If painting is performed indoors the area must be well ventilated and exhaust fans must be used.

(2) Only brush painting will be authorized at the first and second echelon maintenance levels.

(3) The painting with Chemical Agent Resisting Coating (CARC) for cosmetic purposes, such as in the preparation of equipment for inspections and parades is NOT AUTHORIZED.

(4) Emergency first aid procedures.

(a) If CARC paint comes in contact with your eyes, flush them with clean lukewarm water (under pressure) for at least fifteen minutes, occasionally lifting your eyelids. Immediately obtain medical attention.

(b) If your skin comes in contact with CARC paint, remove all contaminated clothing and wash affected areas of the skin with soap and water and thoroughly wash all contaminated clothes before reusing. Do not use solvents to remove CARC paint from the skin.

(c) If CARC paint is inhaled or ingested, seek oxygen or artificial respiration as needed, and obtain medical attention.

(5) Brush or roller painting with CARC paint indoors or outdoors.

(a) To prevent over exposure of any individual to a potentially toxic situation, one painter without a respirator must not be allowed to apply more than one quart of CARC paint per day.

(b) An organic vapor respirator is required when using more than one quart of paint in an open space.

(c) When painting is being conducted in a confined space, an approved respirator is required unless exposure levels determined by local health and safety office indicate otherwise.

e. Safety Requirements for Slave Cable Use.

(1) To minimize battery explosion and to prevent damage to the vehicle's alternator and electrical system, the following vehicle battery slaving sequence should always be used:

(a) First, make sure that the vehicles are not touching, the vehicle's parking brakes are set, the transmissions are in park or neutral, and all electrical loads are turned off.

(b) If the operation is being performed in cold weather, make sure that the electrolyte is not frozen.

(c) The slave cable should first be connected to the slave receptacle on the disabled vehicle and then to the slave receptacle on the slaving vehicle.

(d) With the slave cable connected, start the engine on the slaving vehicle and then start the engine of the disabled vehicle.

(e) After the engine of the disabled vehicle has started, the vehicle's throttle should be pulled out to obtain the desired engine speed (rpm). The slave cable can be removed and stored, and the receptacle cover replaced over the receptacle.

REFERENCES:

1. MCO 5100.19 MARINE CORPS TRAFFIC SAFETY PROGRAM

2. NAVMC 2692 SAFETY PROGRAM MANAGEMENT MANUAL

3. TM 4750-15/1 PAINTING REGISTRATION MARKINGS